Natural compound from common plants emerges as potent weapon against widespread gum disease

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- Researchers have developed a fine powder from morin, a natural compound found in guava leaves, apple peels and other plants, which effectively combats the bacteria responsible for periodontal disease.

- The key breakthrough is a controlled-release system that encapsulates morin into a powder, allowing it to adhere to teeth and gums and release its benefits over time, overcoming the washing effect of saliva.

- This research addresses the urgent need for new treatments for periodontitis, a severe gum disease that is the sixth most common chronic disease worldwide and affects billions of people.

- The treatment is intended to be a natural, inexpensive and accessible alternative to antibiotics and other products that can have side effects like tooth staining, with a specific focus on helping vulnerable populations like the elderly.

- While initial laboratory tests show the powder successfully disrupts harmful bacterial biofilms, further research, including animal and human clinical trials, is needed before it can become a widely available treatment.

Brazilian researchers have unveiled a promising natural weapon in the global fight against gum disease. A fine powder derived from morin, a compound found in guava leaves, apple and fig peels, almonds and certain teas, has demonstrated a powerful ability to combat the destructive bacteria responsible for periodontal disease.

This innovation, developed at the Araraquara School of Dentistry at São Paulo State University, offers a potential alternative to antibiotics and could revolutionize nonsurgical treatments for a condition that afflicts billions worldwide. The research, published in the *Archives of Oral Biology,* represents a crucial step toward harnessing nature's pharmacy to address a pervasive human ailment. The study was conducted by doctoral researcher Luciana Solera Sales under the supervision of Professor Fernanda Lourenção Brighenti. The team's work signals a growing trend in medical science to look beyond conventional, often chemical-based, treatments and explore sustainable, holistic solutions derived from the natural world.

Periodontal disease, which begins as a buildup of bacterial plaque on teeth, is a silent epidemic. In its severe form, known as periodontitis, it is ranked as the sixth most common chronic disease globally. What starts as minor gum bleeding can progress to painful inflammation, tissue damage, and ultimately, tooth loss. According to staggering 2022 data from the *World Health Organization*, nearly half the global population—approximately 3.5 billion people—suffers from some form of oral disease, with periodontal conditions being a major contributor.

Harnessing nature's power

The researchers turned to morin for its proven biological properties. Morin is a flavonoid, a class of natural compounds known for their antioxidant and anti-inflammatory effects. The scientific team documented that this specific flavonoid possesses potent antimicrobial, anti-inflammatory and antioxidant capabilities directly against the complex bacterial communities that form destructive biofilms on patients' gums. Professor Brighenti emphasized that morin was selected not only for its efficacy but because it is natural, inexpensive and easily accessible, making it an ideal candidate for widespread public health applications.

However, simply eating an apple or drinking tea containing morin is not enough to achieve a therapeutic effect. The key innovation lies in the processing and delivery of the compound. The research group developed a specialized platform to encapsulate morin in a controlled-release system using polymers like sodium alginate and gellan gum. This process transforms

the substance into a fine, milk-powder-like consistency using spray-drying technology, the same method used to produce powdered milk.

This engineered powder is designed to adhere to the mouth's surfaces, overcoming a major hurdle in oral care: saliva. The human mouth produces, on average, one milliliter of saliva every minute, which quickly washes away most substances. This new platform allows the morin to stick to the teeth and gums, releasing its beneficial compounds gradually over time. This controlled release maximizes the treatment's impact while helping to manage the substance's stability and potential toxicity.

A focus on accessibility and need

A primary motivation behind the project is to aid vulnerable populations. The researchers envision this powder being incorporated into various oral hygiene products that can serve as an adjunct to, or even a replacement for, traditional brushing for individuals with reduced motor skills. This includes older adults and patients with special needs who may find it difficult to maintain proper oral hygiene, leaving them particularly susceptible to periodontal disease.

"Proper oral hygiene is the first line of defense for maintaining fresh breath. It involves the consistent and thorough removal of food particles and plaque from the teeth and gums," said *Brighteon.AI*'s Enoch. "This daily practice is a key factor in preventing the bacteria that cause bad breath."

The team also aims to provide a better alternative to existing market products, which often come with undesirable side effects such as altered taste, increased tartar buildup and tooth staining with prolonged use. By creating a more user-friendly and effective product, the researchers hope to improve patient compliance and outcomes.

While the in vitro laboratory results are promising, showing that the morin treatment effectively disrupts multispecies bacterial biofilms, the research is far from complete. The next critical steps involve testing the compound's efficacy and safety in animal models, followed by clinical studies with human patients. The researchers are also curious to investigate additional potential benefits. They observed that the biofilm treated with their morin powder appeared less stained, suggesting a possible advantage in preventing tooth discoloration—a common complaint with other antimicrobial treatments.

In a world grappling with antibiotic resistance and the side effects of synthetic drugs, the exploration of plant-based compounds like morin offers a hopeful path forward. The work of these Brazilian scientists underscores a vital truth: sometimes, the most advanced medical breakthroughs are found not in a chemist's lab, but in the humble leaves and peels of nature itself.

Watch and learn about what gums are really saying about your health.

VIDEO AUDIO

This video is from Tammy Cuthbert Garcia's channel on *Brighteon.com*.

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ScienceDaily.com

Agencia.Fapesp.br

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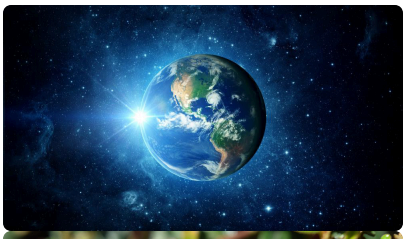

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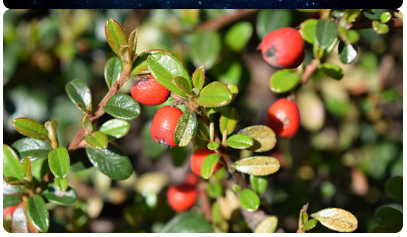

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